

4. POLICY ISSUES

4.1 Do PHC activities justify their costs?

4.1.1 Developing Commonwealth

The number of economic evaluations carried out in any one country is usually too small for outside observers to draw detailed conclusions on the value of investment in PHC as against investment in other areas of the health sector, though countries themselves can usually go some way towards assessing this issue by examining the relative costs of different interventions, even if they have little data on effects or benefits. Because international and national health policy makers over the last few years have been requiring evidence on the value of investment in PHC programmes and particular PHC activities, a number of reviews have been undertaken which attempt to synthesize the results of studies performed in a number of countries (Gwatkin *et al*, 1980; Grosse and Plessas, 1979; Phillips *et al*, 1985, Barlow and Grobar, 1986; Cochrane and Zachariah, 1983; Applied Communication Technology, 1985).

These comparative reviews encounter the problems discussed in Section 2.3 above, namely those of adjusting the figures to a common exchange rate and price base. In addition, comparison of the value of alternative health investments requires selection of an appropriate measure of effectiveness. Since many economic evaluations choose a measure of effectiveness appropriate for the particular health intervention being evaluated (e.g. number of immunized children for an EPI programme; number of case-years of infection prevented for a parasitic disease control programme) their cost-effectiveness ratios can be difficult to convert to a form appropriate for reviewers attempting a comparison between different health interventions.

Choices concerning the value of PHC can be reviewed at four different levels. One level is that of affordability; what is the cost of extending PHC of a particular pattern throughout the country and can it be afforded? If the answer is no, then consideration turns to whether an alternative pattern of PHC services would be less costly. A second level is that of choice between different PHC activities, to see which activities are most cost-effective and to help countries set priorities within PHC. A third level is that of choice between PHC and other health sector interventions, to consider the value of investing in PHC as opposed to other parts of the health sector. Some reasonable evidence is available on affordability, but evidence is limited on choices at the next two levels, especially the third. Finally, there is the question of the efficient delivery of the chosen set of PHC activities.

In the discussion below, the value of PHC activities is therefore considered in four different ways. Firstly, evidence is reviewed on the per capita cost of PHC programmes, expressed as an absolute sum or as a percentage of per capita national income, to give an indication of the affordability of PHC. Secondly, evidence is reviewed of the cost-effectiveness of two particular activities of PHC, immunization and oral rehydration, since a number of studies have been published in both of these areas. Thirdly, evidence is reviewed of the cost per death averted in a number of somewhat heterogeneous health programmes. The section concludes with a consideration of how to deliver PHC components efficiently.

Can the per capita cost of PHC be afforded?

Two main sources are available for reviews of the cost of PHC-type programmes, Gwatkin et al (1980) and Grosse and Plessas (1979). Gwatkin et al assessed the results of ten field projects which provided basic medical and nutrition services aimed at reducing infant and child mortality. Six of these had reasonable cost data. Grosse and Plessas examined the cost of primary health care systems in seven countries to help determine whether it is feasible to

provide a substantial proportion of the population of developing countries with PHC facilities at costs not higher than current government expenditure levels. Figures from these two reviews are presented in Tables 4.1 and 4.2. It should be noted that the Gwatkin et al annual costs are both capital and recurrent, whereas Grosse and Plessas present only recurrent costs on an annual basis, leaving investment costs as a lump sum outlay. No information on the year to which the costs apply is available in Grosse and Plessas. The 'Narangwal' data referred to in both tables provide information on different components of the same research programme.

Gwatkin et al concluded from their survey that PHC-type programmes can cost less than 2% of annual per capita GNP. The Grosse and Plessas figures for the research/demonstration projects are of a not dissimilar order of magnitude. However, Grosse and Plessas argue that the large-scale service programmes had significantly lower recurrent and capital costs. They were all Ministry of Health-run programmes, whereas the demonstration projects were all (except one) designed by American universities which were involved in the research activities of the projects. Drawing a conclusion on the likely cost of large-scale PHC programmes is, however, still difficult, since it is not clear to what extent the large-scale programmes are providing effective PHC services. For instance, where a programme provides primarily curative services, it is possible for frequent health service contacts to be accompanied by high morbidity and mortality rates in the community since patients are treated by the health service only to fall ill again when they return to their homes. A further possibility is that in the large programmes health service resources may be spread so thinly that they may have little effect on health since staff are overstretched, drugs scarce, and so on. Thus the best estimate we have is still that effective PHC programmes may cost the health sector around 2% of annual per capita GNP. In this

Table 4.1 The Costs of Six Primary Health Care Projects Reviewed by Gwatkin et al

<u>Location</u>	<u>Type of Project</u>	<u>Population covered</u>	<u>Price base (yr)</u>	<u>Annual per capita cost (% of per capita annual income) (a)</u>
Imesi, Nigeria	Service	6,000	1966	\$1.50 (2.0%)
Etimesgut Turkey	Pilot	55,000	1968-74	\$6.50-7.50 (1.5-2.0%)
Narangwal, India	Research Pilot	10,500	1970-73	\$0.80-2.00 (0.8-2.0%)
Rural Guatemala II	Research	3,000	1969-77	\$3.50 (0.75-1.0%)
Jamkhed, India	Service	40,000	1978	\$1.25-1.50 (1.00-1.25%)
Kavar, Iran	Pilot	8,200	1975	\$3.50-5.35 (0.4-0.5%)

(a) Recurring plus capital costs

Adapted from Gwatkin et al (1980)

Table 4.2 The Costs of Seven Primary Health Care Projects Reviewed by Grosse and Plessas

<u>Location</u>	<u>Type of Project</u>	<u>Population covered</u>	<u>Annual recurrent cost per capita</u> <u>(% of per capita GNP)</u>	<u>Investment cost per capita</u>
Afghanistan	Large scale service	1.555m	\$0.60 (0.3%)	\$0.70
Dominican Republic	Large scale service	0.651m	\$2.70 (0.4%)	\$1.90
Tanzania	Large scale service	12.000m	\$1.00 (0.6%)	\$0.22
Montero Bolivia	Research/ Demonstration	0.011m	\$15.40 (3.9%)	\$19.80
Cali Columbia	Research/ Demonstration	0.022m	\$9.80 (1.6%)	N/A
Danfa Ghana	Research/ Demonstration	0.015m	\$8.50 (1.5%)	\$32.8
Narangwal India	Research/ Demonstration	0.011m	\$6.10 (3.4-4.1%)	\$5.40-6.00

Adapted from Grosse and Plessas (1979)

estimate, basic and village-level health services are included, but water and sanitation excluded. A recent study attempting to include all costs (capital, recurrent and training) estimated that annual expenditure of up to 5% of GNP would be required to achieve Health for All based on the essential elements of PHC including MCH and immunization, plus water and sanitation (Patel, 1986).

These costs are by no means inconsiderable. A recent review of health expenditure patterns suggests that low income countries spend between 1% and 2% of GNP on all publicly provided health services (excluding water and sanitation), and lower middle income countries approximately 2% to 3% (de Ferranti, 1984). Thus spending up to 2% of GNP on primary health care implies either a substantial shift in resource allocation patterns, or a substantial increase in resources for the health sector. However, admittedly scanty evidence suggests that adding private to public health expenditure at least doubles the percentage of GNP spent on health care (de Ferranti, 1984). Thus the outlook for PHC is more hopeful if a combination of sources of finance (i.e. both public and private) can be drawn upon, or if it is possible to tap, for publicly-provided PHC, some of the household resources at present used to purchase private sector health services.

What is the evidence on the cost-effectiveness of the PHC activities of immunization and oral rehydration?

The second area reviewed here is the cost-effectiveness of two particular PHC activities. Phillips et al (1985) have summarised the cost-effectiveness of EPI programmes, using the measure 'cost per fully immunized child'. Since most of the studies reviewed concentrate on cost analysis, it is not easy to move beyond this measure to a cost per case or death averted. Table 4.3 summarises the results of the international comparison, expressing the figures in 1982 US dollars. Delivering the full EPI schedule of

Table 4.3 Comparative Vaccination Cost per Fully Vaccinated Child

<u>Country</u>	<u>Vaccines delivered</u>	<u>Strategy</u>	<u>Cost per fully vaccinated child (local currency & date)</u>	<u>Cost per fully vaccinated child (\$US 1982 equivalent)</u>
Brazil	Full EPI	(i) routine (static)	4671 cruzeiros (1982)	26.0
	Full EPI	(ii) intensification (outreach)	1579 cruzeiros (1982)	8.8
	Polio	(iii) campaign (mobile)	378 cruzeiros (1982)	2.1
Cameroon	Full EPI	mixed (static/mobile)	2758 francs (1981)	9.5
Gambia	Full EPI	mixed (static/mobile)	38 dalasi ¹ (1980/81) 24 dalasi ² (1980/81)	19.2 12.0
	Full EPI	(i) outreach (ii) mobile	41 cedi (1979) 12 cedi (1979)	154.0 45.5
Indonesia	BCG, 2 DPT	mixed (static/mobile)	1412 rupiah (1979)	2.6
Ivory Coast	Full EPI	(i) mobile unit - Abengourou	2628 francs (1980/81)	8.9
		(ii) static centres - "	5432 francs (1980/81)	18.5
		(iii) static centres - Abidjan	1880 francs (1980/81)	6.4
Kenya	Full EPI	static	150 shillings (1981)	16.6
Philippines	BCG, 2 DPT	outreach	30.12 pesos (1978)	6.2
Thailand	BCG, 2 DPT	mixed (static/mobile)	217.3 baht (1979)	13.2

1. The full EPI schedule includes BCG, DPT, Polio and measles vaccines
2. With expatriates
3. Without expatriates

Source: Phillips et al (1985)

immunizations cost between \$6.4 and \$26.0 per fully immunized child. (The Ghana figures have been excluded from this range because over-valuation of the cedi makes the dollar cost unreliable.)

A similar type of comparison has been made for programmes designed to encourage the use of oral rehydration therapy (Applied Communication Technology, 1985). Here, however, costs were expressed not only as per capita of the target population (children) but also as per death averted. The results are shown in Table 4.4. Costs have been adjusted to a price base of 1985.

The figures suggest that oral rehydration can be a relatively cheap intervention in terms of cost per child and cost per death averted. A notable feature, however, from both Table 4.4 and Table 4.3, is the variation in the costs. For immunization, where the technology is reasonably standardized and known to be effective if properly administered, costs per child for the full EPI schedule vary four-fold between the least costly and the most costly (excluding Ghana). For oral rehydration, however, costs and deaths averted vary over twenty-fold, and cost per death averted eighty-five-fold. Much of the explanation for this variation presumably lies in different technologies used to encourage the use of oral rehydration and varying responsiveness of the target population.

This evidence on the variation in the costs of programmes targeted at similar diseases is supported by an extensive review of the costs and benefits of controlling parasitic diseases (Barlow and Grobar, 1986). For instance, they quote costs (1984 prices) of mollusciciding projects directed against schistosomiasis varying between \$9.28 per case-year prevented (Iran) to \$84.23 (St. Lucia). The range for vector control projects directed against malaria was \$1.88 to \$92.10 per case-year prevented. This

Table 4.4 Comparative Cost-effectiveness of Oral Rehydration Projects based on Diarrhoea-associated Deaths

<u>Project or site</u>	<u>Country</u>	<u>Cost per child per year (1985 \$)</u>	<u>Deaths averted per 1000 children</u>	<u>Cost per death averted</u>
Matlab Hospital	Bangladesh	0.50	4.04	\$124
Sukawati	Indonesia	1.14	6.97	\$163
Darmaraja	Indonesia	1.50	8.46	\$177
Mass Media	The Gambia	1.56	6.94	\$224
Bandung	Indonesia	0.92	3.25	\$283
Campurdarat	Indonesia	1.38	4.73	\$291
Salt/Sugar Home	Egypt	4.76	8.20	\$580
Oralyte Home	Egypt	4.99	7.80	\$639
Mass Media	Honduras	4.14	5.16	\$802
Salt/Sugar Pre.	Egypt	9.99	7.00	\$1427
Oralyte Comm.	Egypt	5.56	2.00	\$2780
Con 2-Awareness	Egypt	4.24	0.40	\$10600

Source: Applied Communications Technology (1985)

variation cautions strongly against placing excessive reliance on individual cost-effectiveness estimates where the programme technology, content and effectiveness can vary considerably, and emphasises the need for each country to evaluate the likely cost-effectiveness of a particular programme in its own circumstances and given its chosen technology.

It is also important to stress that some variation in cost-effectiveness results is likely to stem from differences in study methodology. It is therefore extremely important to review the methodology of studies, and particularly to consider whether costs have been calculated appropriately, whether any significant cost items have been omitted, and whether effectiveness estimates are realistic and based on adequate evidence.

How does the cost-effectiveness of PHC programmes compare with other health programmes?

To complete this review of international comparisons of the value of PHC, it is useful to end with some cross-programme comparisons of cost-effectiveness, though they must be interpreted with great caution and in the light of the comments on international variations made above. Cochrane and Zachariah (1983) have reviewed the cost-effectiveness of programmes designed to reduce mortality and their results are shown in Table 4.5. No attempt has been made to convert the costs to a common year. In general, PHC-type programmes such as Narangwal, and PHC activities such as immunization and oral rehydration (see Table 4.4) appear as 'good buys' for the health sector relative to hospital care, malaria control or improvements in water and sanitation. Data are lacking, however, to judge how sensitive such conclusions might be to variations in cost (for instance the cost of malaria control is likely to vary enormously between countries depending on the control measures required and their means of delivery) and to variations in

Table 4.5 Cost Per Death Prevented Through Different Health Interventions

<u>Author</u>	<u>Intervention</u>	<u>Country</u>	<u>Cost Per Death Prevented</u>
Shepard (1982)	Measles immunization (includes all joint costs of a programme of polio, DPT, BCG and tetanus)	Ivory Coast	\$490
Barnum <u>et al</u> (1980)	Total immunization programme	Indonesia	\$130
	BCG programme only		\$445
	DPTT programme only		\$135
	BCG added to existing programme		\$101
	DPTT added to existing programme		\$77
Barlow (1976)	Mass vaccination	Morocco, 1971	
	BCG		\$24
	DPTT		\$38
	Polio		\$1,100
Barnum (1980)	Immunization total	Kenya	\$85
	DPT, TT, BCG only		\$274
	Measles only		\$50
	Polio only		\$6,357
	DPT, TT, BCG		\$69
	Measles added to existing programme		\$26
	Polio added to existing programme		\$568
	New births only		\$70
Barnum & Yaukey (1979)	Health programme separate	Nepal	\$508
	Integrated with family planning		\$271
Faruqee & Johnson (1981)	Nutrition programme prenatal	Narangwal, India	\$7.75
	Health care - infant		\$25.00
	- child		\$31.00
Barlow (1976)	Hospital	Morocco, 1971	
	Large		\$2,640
	Medium		\$2,820
	Small		\$2,360
Horton & Claquin (1982)	Hospital treatment for diarrhoea	Bangladesh	
	Sotaki		\$187
	Matlab		\$1,262-
			\$1,352
Prescott (1980)	Malaria eradication (Spraying and drugs)	Bangladesh	\$809-
			\$25,090
Walsh & Warren (1979)	Mosquito control - malaria (infant and child)	Cross-country analysis	\$600
	Community water supply, sanitation		\$3,600-
			\$4,300
	Selective primary health care		\$200-
			\$250

Adapted from Cochrane and Zachariah (1983)

effectiveness (for instance countries with high mortality levels can potentially achieve a larger absolute reduction in mortality than countries where mortality rates have already fallen). In addition, the figures should be treated as only a very rough guide to cost-effectiveness since the measure 'deaths prevented' quantifies only a part of the health effects of the various interventions, and presumes that mortality reduction is the overriding objective of health policy makers. Measures such as the 'quality adjusted life-year' discussed in Section 1.3 are preferable, but as yet little used in developing country studies.

How can PHC be delivered more efficiently?

Given that PHC appears to offer good value for money, attention should therefore turn to how best to deliver a chosen set of PHC activities. A number of choices face decision makers designing a PHC programme, such as choice of target group; choice of the public or private sector for the delivery of supplies such as essential drugs and contraceptives; choice of intervention both between PHC activities (e.g. family planning, immunization) and within a particular activity (e.g. choice of contraceptive method); choice of delivery strategy (e.g. integrated/non-integrated, and static/mobile), and choice of place of intervention such as health centre or patient's home. Such choices can drastically affect both the costs and effectiveness of PHC programmes, and careful evaluation of the choices can help determine the design of an efficient and effective PHC system. However, very little attention has been paid to these questions in economic evaluations. Tentative conclusions are possible only in the area of choice of delivery strategy. There is now considerable evidence, reviewed earlier, that integration of services can bring benefits both in terms of increased effectiveness and reduced costs, providing that the efficiency of the newly integrated programme can be maintained. However, there is less evidence on whether integration is more appropriate for some services (e.g. child care) than for others (e.g. malaria control).

Also in the area of choice of delivery strategy, evidence is accumulating on the relative costs of fixed versus mobile strategies, for instance for immunization. Unfortunately, no clear-cut policy recommendations have emerged. Mobile strategies appear to offer a cheap way of achieving high levels of coverage in the short term, but may provide a more limited range of benefits than immunization services that are integrated with other PHC services, and may be difficult to sustain in the long term.

4.1.2 Developed Commonwealth

In developed countries PHC is seen as an important gatekeeper, controlling the use of expensive secondary care services. For example, the prevention of illness can be justified by the averted costs of hospitalization or medical services, the effective treatment of minor ailments by family physicians can avert the need for specialist services and the existence of good community services for the elderly, mentally ill and mentally handicapped can obviate the need for institutional care. There is also a general belief that treatment in the community is preferred by patients.

However, PHC has to compete with secondary care for scarce resources. Treatment for life-threatening conditions in the hospital often presents as a more immediate problem requiring quick action and arousing public sympathy. In addition, the rapid technological change in medicine, which shows no sign of abating, means that scarce resources are increasingly drawn into secondary care in spite of stated priorities for prevention, primary health care and care for disadvantaged groups such as the elderly or mentally ill.

Therefore, despite the general belief in the efficacy of primary health care in developed countries, there is still a need for expenditure in this area to be justified if PHC

is to compete satisfactorily with suggestions for more investment in secondary care. More precisely three issues can be addressed:

- does PHC provide a feasible and more cost-effective alternative to secondary care in the prevention or treatment of certain common conditions?
- is PHC being organized as efficiently as possible?
- what would be the relative value for money of greater investment in PHC as compared to other potential uses of the same resources?

These are discussed in turn below.

Does PHC provide a feasible and more cost-effective alternative to secondary care?

One general message from the review of evidence presented in Section 2.1.2 and the case study presented in section 3.4 is that one would be unwise to answer this question in global terms, since the costs and benefits of PHC activities depend crucially on how these are applied and on the existence of secondary care alternatives. However, the general picture is that most of the PHC activities that have been evaluated from an economic viewpoint perform well when compared with the alternatives.

In the field of primary prevention, most of the vaccination programmes evaluated have shown direct benefits (in health service resource use averted) in excess of the costs of mounting the programme. The only qualifications to be made to this overall conclusion are as follows:

- (i) Some vaccination programmes raise ethical issues since a minority of individuals may suffer harmful side effects (e.g. pertussis vaccine).

(ii) One should carefully examine proposals for expansion of existing programmes to larger populations since the marginal costs may rise significantly while the marginal benefits may remain constant (e.g. extension of influenza vaccination programmes beyond high risk groups).

(iii) Vaccination programmes, while having the potential to save resources, may be an add-on to health care expenditure unless concerted efforts are made to reduce the supply of certain resources (e.g. hospital beds). Therefore proposals to mount new programmes on economic grounds should have an associated managerial plan for rationalising the use of freed resources.

The other major topic in primary prevention is that of health promotion. Here the evidence for the effectiveness of programmes, and hence their ability to generate benefits in improved health and in resource savings, is less convincing (Russell, 1986). Therefore governments would be advised to make evaluation a more central component of these programmes than has been customary to date.

In the field of secondary prevention, activities in screening for disease were reviewed in Section 3.4. In general the results favour the adoption of screening programmes on economic grounds. However, as in the case of vaccination programmes, several qualifications should be made.

(i) As with vaccination programmes, managerial initiatives are probably required to ensure that freed resources are put to good alternative uses, or the supply of resources reduced.

(ii) The choice of population to be screened, frequency of screening and type of screening test all crucially affect costs and benefits. (e.g. in Canada it was argued that the health examination should be periodic rather than annual, and targeted rather than general.) Also, in

Ontario there has been debate about the appropriate number of well-baby visits that should be funded under the provincial health plan.)

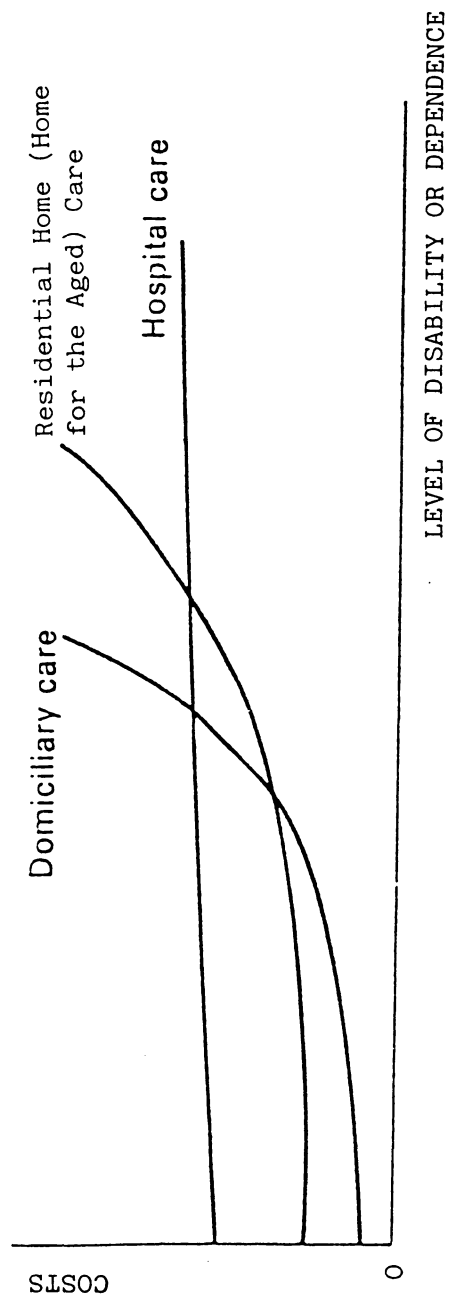
(iii) Screening of the unborn sometimes raises ethical issues. One approach would be to calculate the net impact of such programmes on health service resource use and government expenditure. Then, if the programme's financial benefits exceed its costs, one may be able to offer the programme and leave it to individuals whether or not they participate.

In the long term care field there is growing evidence that it is both feasible and more cost-effective to develop community based services for the elderly, mentally handicapped and mentally ill. The main issues that have so far arisen in the literature are as follows:

(i) The relative costs and benefits of community and institutional care depend crucially on the dependency of the patient. Care in the patient's own home may be of lower cost than the alternatives where the patient's dependency level is low. However, at higher levels of dependency the cost of domiciliary care can rise above that of institutional care. (See Figure 4.1) It is therefore important to undertake more assessments of dependency and cost of care in different settings, in order to estimate the 'break even' point(s) and to explore the extent to which higher funding for community care programmes might be justified on the grounds of higher benefits.

(ii) Many economic evaluations of community care programmes have not paid sufficient attention to costs borne by the family and the burden on the care-giver. Research is now underway (Mohide et al, 1985) which may throw some light on these issues.

Figure 4.1 Alternative Forms of Care for the Elderly: the variation of cost with level of disability
(Source: Drummond, 1980)



(iii) Community care programmes for the elderly, mentally ill and mentally handicapped require the co-ordination of a number of public and voluntary agencies. There needs to be more research into ways of achieving more effective co-ordination and into the role that budgetary incentives might play in bringing about a more efficient delivery of services (Maynard and Smith, 1983).

Is PHC being organised as efficiently as possible?

Even if PHC activities compare favourably with other health care alternatives, there is still a need to ensure that the PHC activities themselves are operating as efficiently as possible.

One point has already been made; namely, in the long term care field much could be gained from better co-ordination of the different agencies providing care. The initiatives here can be organisational, by perhaps setting up a system whereby the needs and dependency of patients are adequately assessed and therefore appropriate placement made, or financial, whereby budgetary responsibility for caring for the patients concerned is vested in one organisation, which would then buy in care from a range of appropriate agencies (Wright, 1984). Or, as a third approach, two agencies can be given financial incentives to plan and deliver services jointly. This is the philosophy behind joint financing schemes between health and local authorities in Britain, where funds are specifically allocated for joint initiatives.

Second, an assessment of the operation of family practice ought to be made in order to ascertain whether it could be made more efficient by:

- delivering existing services at lower cost, perhaps by the use of different types of manpower, or controlling prescribing costs;

- increasing the range of services provided, stressing preventive and health promotion activities;
- using expensive diagnostic and secondary care facilities more carefully.

As was mentioned earlier, several initiatives have already been taken in this area in the Commonwealth. In Canada the nurse practitioner project demonstrated the possibilities for using other forms of manpower and there has been some experimentation with pre-paid group practice, as in New Zealand. In Britain a recent consultative document (DHSS, 1986) suggests that general practitioners will be given incentives to provide a wider range of services and also there have recently been attempts to control prescribing costs. However, no Commonwealth country has yet experimented with consumer choice health plans as has been done in the USA (Enthoven, 1985). Under these schemes individuals are given a choice of forms of health care cover, which may vary in price and range of service (subject to certain minimum criteria being met). The objective is to encourage more competition among the suppliers of health care, with a view to increasing efficiency. The advantages and disadvantages of such an approach require further investigation in different country contexts.

What would be the relative value for money of greater investment in PHC?

The key to answering this question is in the development of a method for comparing the benefits of disparate health programmes. The best method so far developed is that discussed in the paper by Torrance and Zipursky (1984). Their interest was in whether antepartum administration of anti-D gamma-globulin, which would result in a net cost to the health care sector, represented a good use of resources when compared to other possible health care

programmes. In order to address this issue they calculated the cost per quality-adjusted life-year (QALY) gained by the anti-D programme and compared this with similar indices for some alternatives. These had been calculated in other studies in Canada and the USA (see Table 4.6). It can be seen that the anti-D programme, which it had been argued was too expensive, gives relatively good value for money when compared with some of the alternatives. Other PHC activities shown in Table 4.6 are PKU screening, treatment of hypertension and the school tuberculosis testing programme. There are obviously a number of qualifications that need to be made. The studies whose results are compared were undertaken in different locations at different times and may have employed different methodologies. Also, the QALY measure, whilst rapidly gaining wider acceptance, is still a subject of discussion and debate. In particular there needs to be more exploration of the methods of calculating QALYs and the different values placed on the utility of health states by different sections of the population (e.g. professionals, patients, members of the general public). Finally, it may be that there are other factors that policy makers also wish to take into account when deciding on the priorities for health service investments, such as the number of people having access to the programme, its overall cost and affordability, and the fairness (or equity) in the allocation of resources to different sections of the population.

However, the usefulness of such 'league tables' of the costs and benefits of health care programmes is likely to become greater as more evaluations are undertaken and as evaluation methods are improved. Whilst not forming the total basis for health care decisions, they should give policy makers a broad indication of the relative value for money from investments in PHC and other forms of health care.

Table 4.6 Comparative Cost-Utility Results for Selected Health Care Programmes*

PROGRAM	REPORTED COST/QALY*	ADJUSTED‡ COST/QALY†
	GAINED IN U.S. DOLLARS (year)	GAINED IN U.S. DOLLARS 1983
PKU screening	< 0 (1970)	< 0
Postpartum anti-D	< 0 (1977)	< 0
Antepartum anti-D	1220 (1983)	1220
Coronary artery bypass surgery for left main coronary artery disease	3500 (1981)	4200
Neonatal intensive care, 1000–1499 gm	2800 (1978)	4500
T4 (thyroid) screening	3600 (1977)	6300
Treatment of severe hypertension (diastolic \geq 105 mm Hg) in males age 40	4850 (1976)	9400
Treatment of mild hypertension (diastolic 95–104 mm Hg) in males age 40	9880 (1976)	19,100
Estrogen therapy for postmenopausal symptoms in women without a prior hysterectomy	18,160 (1979)	27,000
Neonatal intensive care, 500–999 gm	19,600 (1978)	31,800
Coronary artery bypass surgery for single vessel disease with moderately severe angina	30,000 (1981)	36,300
School tuberculin testing program.	13,000 (1968)	43,700
Continuous ambulatory peritoneal dialysis	35,100 (1980)	47,100
Hospital hemodialysis	40,200 (1980)	54,000

*These studies use similar, but not identical, methods. Generally, costs are net health care costs; however, discount rates and preference weights are not completely consistent. Differences in methods should be considered when comparing the relative cost-utility.

†QALY denotes quality-adjusted life-year.

‡Adjusted to 1983 dollars according to the US Consumer Price Index for Medical Care for all urban consumers. Source: US Bureau of Labor Statistics, *Monthly Labor Review*.

4.2 How should studies be commissioned?

One of the major findings from this review is that governments are not very active in commissioning research into the costs and benefits of PHC activities. In the developing countries it is often international agencies such as WHO or the World Bank that take the lead. In the developed countries of the Commonwealth much is left to the initiative of independent researchers to identify the problem area, to design the study and to seek funding (either from the Ministry of Health, research councils, or agencies providing health care).

Whilst the activities of international agencies and independent researchers should continue to be encouraged, Ministries of Health are much more likely to receive policy relevant results if they either undertake more economic evaluations in-house, or play a more active role in commissioning studies. Apart from ensuring that the most relevant problem areas are investigated, this approach would increase the commitment on the part of policy makers to use the results, although other considerations may prevent the wholesale adoption of study recommendations on every occasion.

Whether Ministries undertake evaluations in-house or commission them from universities or other institutions, they will require some measure of economics expertise if they are to make the most of economic analysis. In commissioning studies it is important that Ministries are able to judge the methodological quality of research protocols and to interpret results intelligently. It is to be hoped that this report contributes in a small way towards this goal, although there is a broader need for educating policy makers in the potential and limitations of economic evaluation.

Given the overall limitations on the resources available to undertake economic evaluations, especially the skilled manpower required, it is important for Ministries to develop a policy for when to undertake economic analysis. For example, Williams (1974) suggested that economic evaluation is most likely to pay off in situations where (i) sizeable amounts of resources are at stake; (ii) responsibility is fragmented; (iii) the objectives of the respective parties are at variance or unclear; (iv) there exist alternatives of a radically different kind; (v) the technology underlying each alternative is well understood; and (vi) the results of the analysis are not wanted in an impossibly short time.

Clearly it does not make sense to devote considerable amounts of scarce resources to undertaking evaluations when there is little chance of better decisions being made. Managerial arrangements should therefore be in place to make it possible to act on study results. However, in many situations it may be more the way of thinking embodied in economic evaluation that is important. That is, economic evaluation provides a useful framework for thinking about choices in health care. A simple checklist of questions based on economic evaluation has been proposed for judging requests for health service developments (see Table 4.7). Only in a minority of cases may it be necessary to go further and to estimate costs and benefits of the alternative programmes although, as will be argued later, it is important to build an evaluation component into a broader range of health care activities.

4.3 How should studies be conducted?

In situations where studies are carried out it is important that the key methodological principles are adhered to. These were set out briefly in Sections 1.3 and 2.2, and are given more fully in the Technical Appendix. Particularly important points to note are that

Table 4.7 Checklist of Questions Policy Makers should ask of any Proposal for Service Development (Source: Drummond, 1984)

Consideration of alternatives

What is the main justification for the proposed service; what would be the consequence of doing nothing at all?

Does the proposal contain an explicit comparison of alternative treatments or programmes, or is the implicit alternative the existing service provision?

If a completely new alternative treatment or programme is proposed:

- is it adequately described?
- why was this particular option chosen?
- were other options rejected, if so why?

Would costs and benefits be substantially different if the proposed service provision were of a different scale? That is:

- if the service provision could be larger, what would be added and what would be the additional costs and benefits?
- if the service provision had to be smaller, what aspects of it would be cut and what would be the reductions in costs and benefits?

Is it claimed that the proposal will be partly self-funding, in that savings will be generated? If so, what specific actions need to be taken to realise such savings (e.g. closing hospital wards or whole institutions) and what are the likely resource costs associated with taking these actions?

Assessment of cost and benefits

In evaluating the proposed service against alternatives, what range of costs is considered? Does this include:

- capital as well as revenue costs?
- costs other than those resulting in money expenditure (e.g. the opportunity cost of space denied other uses)?
- costs outside the immediate department where the service will be provided?
- costs on parties other than the Health Authority (e.g. patients, other public agencies)

What is known about the effectiveness of the health treatments or programmes discussed in the proposal?

- have these been evaluated by a randomized controlled trial or similar method?
- are there plans to monitor the effectiveness of any new procedures; if so, how?

Other important issues

Does the proposal acknowledge any differences in the timing of costs and benefits between the alternatives assessed? If so, how is this dealt with in the proposal?

What are the main sources of uncertainty surrounding the proposal (e.g. in the effectiveness of new medical procedures, or in expected revenue costs or savings)?

- what happens to costs and benefits if the analysis is re-worked using more pessimistic assumptions?
- what could be done, perhaps at a slight increase in cost, to reduce uncertainty (e.g. by additional information gathering)?

The above checklist does not comprise a comprehensive range of questions. It is the intention that the questions themselves, and the responses they solicit, will suggest further questions pertinent to the evaluation of choices in the use of health service resources.

costs other than those falling on the Ministry of Health should be considered if the evaluation is being carried out from a societal perspective; the economic evaluation should be based on good medical evidence; and the sensitivity of study results to changes in the key parameters should be tested. Furthermore, the study results should be presented in a form that enables study methodology to be assessed. In this review it was often impossible to assess, from published material, how costs and benefits were estimated.

It has recently been suggested (Russell, 1986) that economic evaluation methodology should be standardised in order to facilitate comparisons across studies. This is probably some years away in the PHC field, given the controversy over some methodological issues. However, greater adherence to well accepted methodological principles should be encouraged.

Improvements in the quality of economic evaluation would be brought about if more Ministries had a policy for developing and supporting centres of excellence within universities or other local institutions. Given the comments above about basing economic evaluations on good medical evidence, multidisciplinary groups should particularly be encouraged. Even where international agencies bring in additional expertise, it is vital to have a local input to the evaluation to ensure relevance to the country concerned and the development of local expertise. In some countries this may require a concerted effort in the recruitment and training of economists with a special interest in the health field. Other countries may already have the necessary expertise.

In commissioning universities to undertake economic evaluations in the health care field, it is important that Ministries keep in close contact with the progress of the research in order to ensure relevance of the study results. It appears that this had been done with varying degrees of success in the studies reviewed.

4.4 How should study findings be interpreted and implemented?

The discussion in Section 4.1 pointed out some of the difficulties in interpreting the results of studies conducted in different settings. Three points were emphasised: the need to be clear on the precise nature of the strategies evaluated in the study concerned; the need to appreciate the key methodological features of the study; and the need to interpret study results in the light of one's own circumstances. The issues still merit attention when interpreting the results of an evaluation conducted in one's own country. Many projects are carried out under ideal conditions which may not exist in other locations. Alternatively, research criteria may require that service activities are carried out in a more time-consuming way than might be the case in a normal service setting. This further emphasises the need for governments to have some measure of economics expertise available, if merely to interpret existing published studies rather than to undertake or commission further evaluations.

One major deficiency in the economic evaluations carried out to date is that analysts pay very little attention to the problem of extrapolating study results from one setting to another or from the research study to normal service delivery. It may therefore be important for national governments and international agencies to put more effort into developing methods for synthesizing study results, along the lines of the studies by Grosse and Plessas (1979), Barlow and Grobar (1980) and Torrance and Zipursky (1984) cited in Section 4.1 above.

This survey has thrown very little light on the issues of implementation of economic evaluation results. Clearly some of the recommendations made above, on the close involvement of policy makers in the commissioning and conduct of studies, may assist in the implementation of results. Previous surveys have shown that many

independent researchers undertake studies merely out of interest and are not concerned beyond publication of the results in a reputable journal (Drummond and Hutton, 1986). Ludbrook and Mooney (1984) point to further problems in implementation in Britain. These include the lack of awareness about economic evaluation, misconceptions about economic evaluation, the political framework in which decision making takes place, the potential threat to professional expertise and the practical and methodological problems in carrying out the evaluations themselves.

Certainly it has to be recognised that economic evaluations merely identify the potential for gains in economic efficiency. It may be that the costs of making the necessary managerial and organisational changes exceed the potential gains, or that other governmental objectives are more important. Therefore it is not irrational to reject study results providing the implications (in inefficient use of resources) are fully understood. Unfortunately policy makers usually have to take decisions without adequate information on the costs and benefits of health programmes. It is this information which economic evaluation seeks to provide.